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THE BLAKEMORE STRAWBERRY

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ORIGIN AND ADAPTATION

The Blakemore (U. S. D. A. No. 659) strawberry originated from a cross of Missionary × Howard 17 (Premier) made in 1923 at the United States Plant Field Station, near Glenn Dale, Md. The seedlings of this cross were set in the fall of 1923, and the Blakemore was among the selections of this cross made in 1925. Sufficient plants were available to send them out for trial in 1927. During the fruiting season of 1927, in comparison with many other sorts in the field plots at the United States Plant Field Station, it was picked out by the head of the research laboratories of the National Preservers' Association and, after thorough preserving tests with the fruit in the laboratory, was selected as the most satisfactory variety for preserving and as superior to all known commercial varieties. In 1928, after tests at the Coastal Plain Branch Station, Willard, N. C., it was selected as the most promising new commercial variety for the strawberry region near there. In 1929 it again was chosen as the most promising general market variety for that region. It has also been selected as the most promising new early sort in the fruit region near Camden, N. J.

Because the results of tests have so far shown many points of superiority and no weaknesses as compared with the Missionary, it is suggested for growing in the eastern North Carolina section northward to New Jersey, and is suggested for thorough trial in all regions where either the Klondike or the Missionary variety is grown and in the southern part of the regions where Howard 17 (Premier) is grown.

[1] The cooperation of C. P. Lathrop, head of the research laboratories of the National Preservers' Association, in the selection of the Blakemore as a preserving variety and in preserving tests and chemical analyses, and of Charles Dearing, assistant director in charge of the Coastal Plain Branch Station of the North Carolina Department of Agriculture, in field and shipping tests, is gratefully acknowledged.

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The Blakemore has succeeded under a wide range of field conditions. It has been grown on a clay and on a sandy loam in both New Jersey and Maryland and on rather light, medium, and fine sandy loams in North Carolina. It may not succeed well on the lightest sandy loams, but it has grown well on the other soil types.

Although most tests have been made under the matted-row system, it has succeeded equally well under the hill system of training.

CHARACTERIZATION

The value of a new variety may be most readily estimated by comparison with the standard variety or varieties of any section. Hence, in this circular the characteristics of the Blakemore are compared with those of the Missionary and to some extent with those of the Klondike and Howard 17.

The plants are somewhat more vigorous than those of the Missionary, with foliage more resistant to leaf spots. The common leaf spot (*Mycosphaerella fragariae*) sometimes occurs on this variety but has never been serious, while the variety is very resistant to "leaf scorch" (*Diplocarpon earliana*) which is so serious on the Klondike and at the end of the picking season is sometimes serious on the Missionary and Howard 17. Runners are produced fully as freely as by the Missionary. The blossoms are perfect, the stamens containing more pollen than those of Missionary. Its pistils are often tipped with red like those of the Missionary. Neither this variety nor Missionary nor Howard 17 produces stamens and pollen as freely at the beginning of the blossoming season as does the Klondike.

In North Carolina the variety is slightly earlier than the Missionary, in 1929 being two to four days earlier. In that State it is approximately the same in season as the Klondike and about two weeks earlier than the Howard 17. In Maryland the season of the Blakemore may be slightly earlier than that of Missionary and Howard 17, but it is not as long as that of either of those varieties. In New Jersey in 1929 the season of Blakemore was shorter than that of Howard 17, beginning about the same time and ending sooner.

Under conditions so far tested in the Carolina section it has been somewhat more productive than the Missionary and much more productive than the Klondike, at each picking from the first to the fifth producing in 1929 more berries of United States Standard No. 1 grade and with fewer defective and small berries than either the Missionary or the Klondike. (Fig. 1.) The last two pickings in 1929, the sixth and seventh, did not yield as much as the Missionary. Until more tests have been made its yield can not be accurately compared with that of Howard 17, although under some conditions it has yielded as much as or more than that sort.

The berries are bluntly conic, not long conic like the berries of the Missionary in North Carolina. (Pl. 1 and figs. 1 to 6.) There are fewer white-tipped berries such as are common in the Missionary under some conditions. Moreover, the berries color on the underside better than either Missionary or Klondike. The berries are a bright light red, which does not change on holding, as do the Missionary

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TYPICAL SHAPE AND COLOR OF THE BLAKEMORE STRAWBERRY AND ITS PARENTS

A, Missionary; B, Blakemore; C, Howard 17 (*Premier*).

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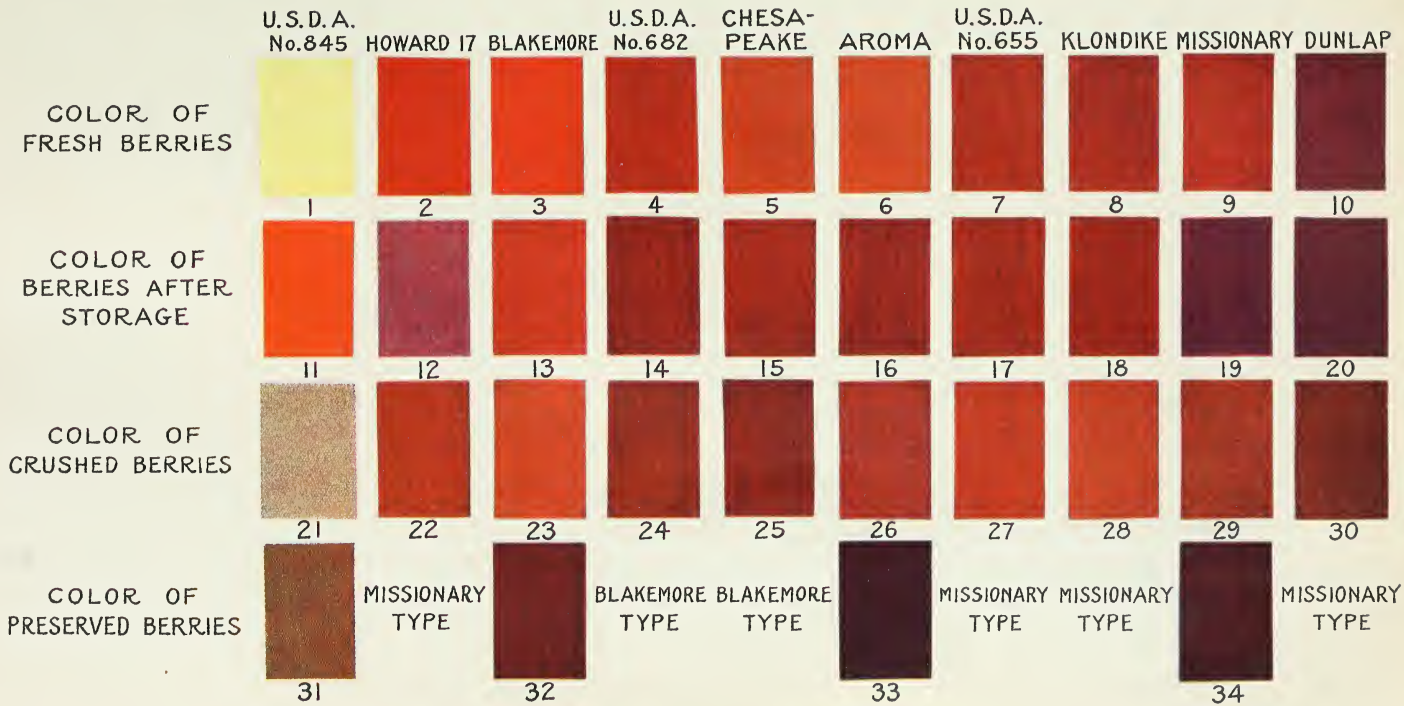

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COLORS OF 10 STRAWBERRY VARIETIES

(For explanatory legend see opposite page.)

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and Klondike colors. (Pls. 1 and 2.) Because of this its color is much more attractive in the market than is that of either the Missionary or Klondike, especially after the berries have been held

FIGURE 1.—Two baskets at left, first picking of Missionary strawberries; two baskets at right, first picking of Blakemore. Upper baskets contain United States Standard No. 1 grade berries; lower baskets, culls and small berries. (Willard, N. C.) At this first picking, from equal lengths of adjacent rows, the Blakemore produced more than four times as much United States Standard No. 1 grade fruit as the Missionary and fewer culls

several days. The berries are much firmer, and the skin is not as easily broken as is that of the Missionary, Klondike, or Howard 17, and the Blakemore berries do not shrivel as much on standing as do

EXPLANATORY LEGEND FOR PLATE 2

The colors and color changes of 10 strawberry varieties are shown in four horizontal rows. In the upper row the colors of fresh ripe berries are given, the colors being roughly graduated from pale to dark. In the next row are recorded the changes due to storage for four days in an ordinary room at summer temperature.[2] The third shows the color of the freshly crushed berries as seen in a plain glass preserving jar. In the bottom row the colors of preserves made from four varieties are shown, also as seen in glass jars. These four color samples in the bottom row may be designated as types. Type 1, U. S. D. A. No. 845, is pale; type 2, the Blakemore, includes two others, namely, Chesapeake and U. S. D. A. No. 682; type 3, the Missionary, is darker than the Blakemore and includes Howard 17, U. S. D. A. No. 655, Klondike, and Dunlap. The fourth, the Aroma type, is somewhat darker than Missionary.

Some of the tints given are to be found in Ridgway's Color Standards and Color Nomenclature (Washington, D. C., 1912). They are Nos. 1 (near baryta yellow), 2, 3, 5, 6 (near scarlet red), 4 (between scarlet and nopal red), 7 and 9 (near nopal red), 10 (acajou red), 12 (near acajou red, but paler), 14 (near carmine), 19 (near vandyke red, but darker), 21 (near light russet vinaceous), 23 (near jasper red, but brighter), and 31 (russet). The others are not matchable. In matching colors it should be borne in mind that they must be brought in juxtaposition, as varying backgrounds cause an apparent variation due to contrast.

[2] The storage color shown for U. S. D. A. No. 845 is that finally developed by one side of fully mature berries, the fresh color of the other side being shown in the yellow color block immediately above.

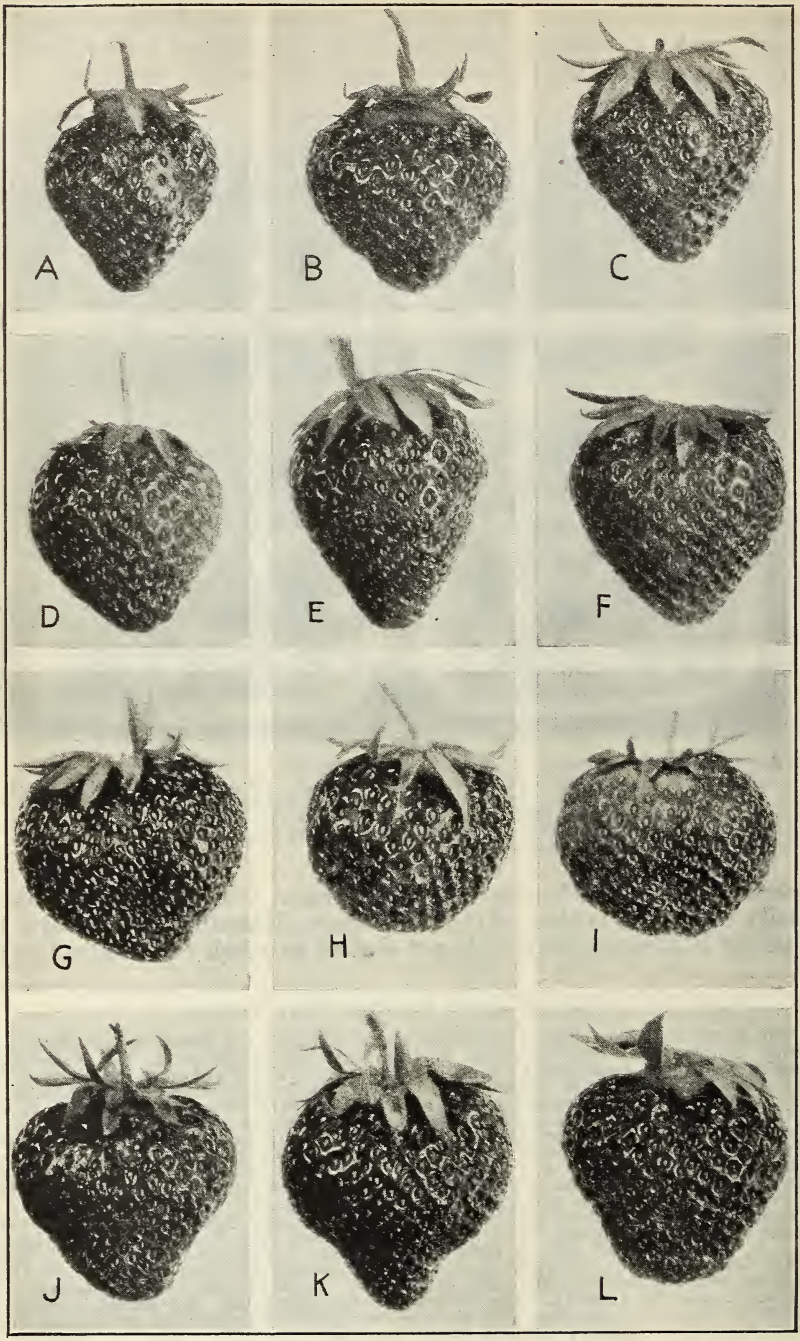

FIGURE 2.—Variations in the shape of the Blakemore strawberry. On vigorous plants the primary berries are commonly similar in shape to that shown at G, while the later berries are more typical, as shown in B, C, and D. In New Jersey many of the berries resemble B, C, and D, but have a blunt end as in I. Though various shapes are shown, the variety actually is relatively uniform in this respect

the Klondike and Missionary berries. Because of its firm flesh and relatively tough skin the Blakemore has proved considerably superior as a market variety. It is easier to pick and to cap (hull) than most varieties. The seeds are slightly smaller and usually closer together than those of common varieties. It is an acid berry of the Missionary and Klondike type, though not as acid as the Klondike; it has a higher pectin content than standard varieties, and it has a better dessert quality than the Missionary and Klondike. Its easy picking

FIGURE 3.—A plant of the Blakemore on April 27, two weeks after the beginning of the ripening season. This shows the "ground fruit" which is produced on basal-branching stems from fruit buds formed the previous fall. (Willard, N. C.)

and capping qualities, its bright light-red color, tough skin, and firm flesh, solid center, acidity, high pectin content, and excellent flavor make it very desirable for preserving.

Under conditions so far tested the berries are larger than those of the Missionary, the Klondike, and the Howard 17, although under some conditions they probably will not average as large as the latter variety.

SUGGESTIONS REGARDING CULTURE

The Blakemore variety produces runners and runner plants in abundance. For this reason the plant beds may readily become too dense unless methods of culture are adopted to control this. If set

FIGURE 4.—"Crown bloom" and "crown fruit" produced by a plant of the Blakemore from spring-formed fruit buds. The three clusters have set 8, 9, and 12 fruits. A fourth flower cluster has its primary (the first) flower open, and a fifth flower cluster is just appearing. This plant also has seven runners. (Willard, N. C., June 6, 1929)

FIGURE 5.—A fruit cluster of the Blakemore strawberry grown in New Jersey on which all of the berries are ripe. Note the more pronounced neck and less pointed shape as compared with the North Carolina grown berries shown in Figures 3 and 6

in early spring the plants may be placed 3 or 4 feet apart in the row with confidence that under ordinary conditions the beds will be filled in. When grown in hills and set late in the spring or summer the Blakemore produces satisfactorily. (Fig. 3.) Because of the superior vigor of this variety it may prove especially well adapted to planting under hill culture in late summer or early fall. This variety responds to fertilizer and yields well on fertile soil.

TECHNICAL DESCRIPTION OF THE FRUIT

Form, a slightly blunted conic with broad shoulder and a slight neck; size medium; pubescence on pedicels ascending, calyx reflexed, medium size; apex ripens uniformly; surface slightly glossy; color bright light red; seeds yellow or greenish yellow, small, even with surface; flesh light red, texture tender, firm, rarely with cavity, juicy; shipping quality excellent; flavor acid, aromatic; dessert quality slightly better than Missionary. Season slightly before Missionary in North Carolina.

COLORS OF BLAKEMORE AS COMPARED WITH OTHER VARIETIES AFTER HOLDING AND AFTER PRESERVING

One of the most valuable characteristics of the Blakemore is the permanence of its mature color. After being held for five days in a room at summer temperatures its color had not faded or darkened, while that of most varieties turned darker. Also after it was preserved there was little change in its light bright color. To illustrate this, a color chart (pl. 2) has been prepared showing the fresh-berry color, the color after storage, and both the colors of the crushed fresh and the preserved berries of 10 varieties.

Berry colors change to some extent with the conditions under which the berries are grown. Where the foliage is heavy the berries are paler than where they are more exposed to the sun. On the dark soils along the Atlantic coast berries are said to be much darker than on the sandy soils. Moreover, because of the difference in leaf growth or for other reasons the color may change to some extent from season to season. The color chart shown here is for the varieties as grown at the United States Plant Field Station, Glenn Dale, Md., on a clay-loam soil in 1929. Color records were taken of other sorts, but those shown are representative. Because the color of preserved fruit depends on the method of preparation and the way the color is read, in this case the preserves were all made by one person in the same way and by one representative commercial method, and the colors were read from standard jars of uniform size.

The fresh-berry color is shown in the top row of Plate 2. At the left is shown the U. S. D. A. No. 845, which is a so-called white variety. To the right the colors become darker. In the second row is shown the color of the same berries of the same varieties after holding at room temperature until their typical storage color appeared. In the third row is shown the color of the fresh berries after they have been mashed by being put through a food chopper. By this means a composite color of the surface and interior was obtained. In the bottom row is shown the colors of the preserved berries after the preserves had been put through a food chopper.

The superiority of the Blakemore, both as a market berry and for preserving, is indicated by the relative permanence of its color.

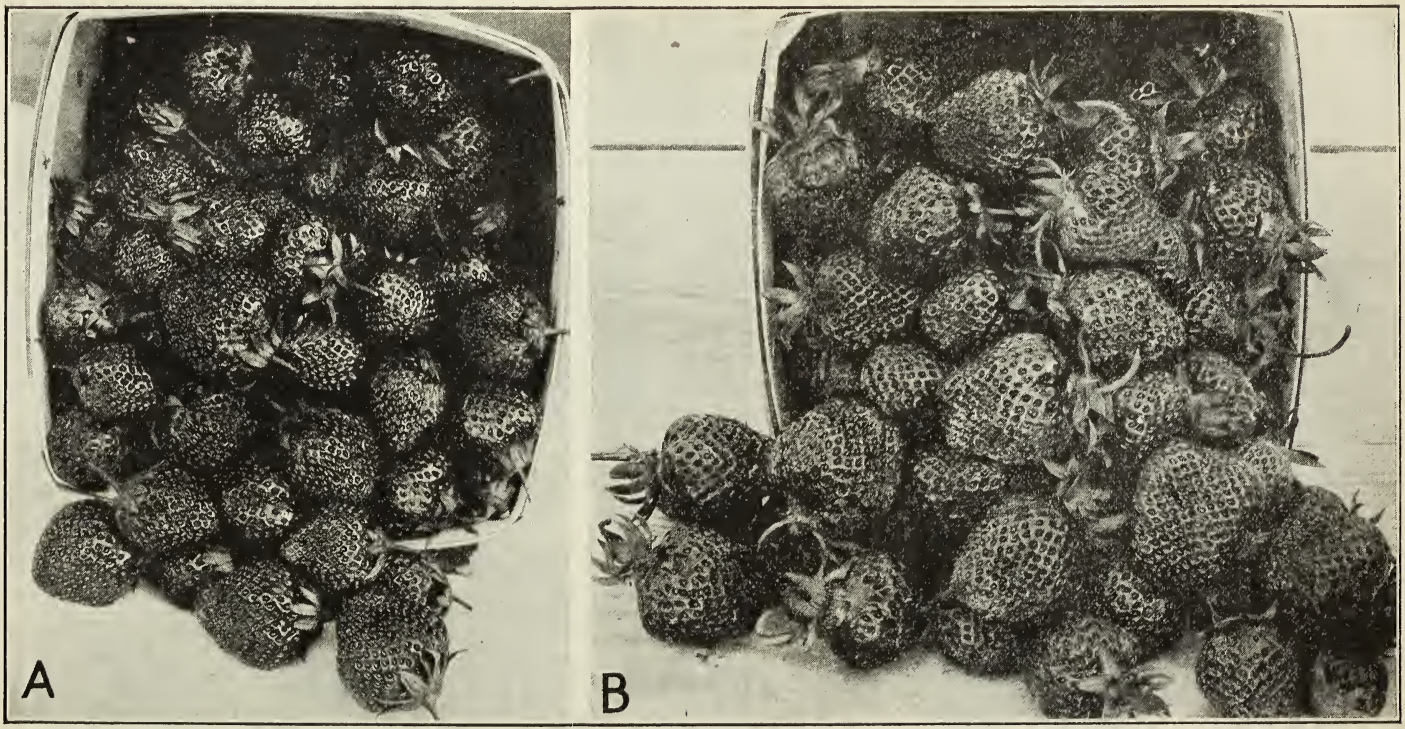

FIGURE 6.—Quart baskets of the Blakemore strawberry grown in North Carolina (A, "crown bloom" fruit) and in New Jersey (B). Note the more pronounced neck and the blunter tip of the berries grown in New Jersey

This applies especially to the varieties now grown in the regions to which it is adapted or in which it should be tried. Berries of the Missionary variety usually darken markedly even after they have been held one day. Though the Howard 17 does not darken as rapidly as Missionary, it does not hold its bright original color as well as the Blakemore. After it has been preserved, the Blakemore is much superior in color to either of its parents.

Preserves made from most varieties turn dark on standing. See, for instance, the colors of the Missionary and the Aroma. The Chesapeake and U. S. D. A. No. 682, however, retain a much lighter color which is very close to that of the Blakemore.

OTHER NEW VARIETIES

The United States Department of Agriculture has several other new varieties under test in the strawberry regions of North Carolina. None of these other new sorts is recommended for trial to replace the Klondike or Missionary. The U. S. D. A. No. 655, also a cross of Missionary and Howard 17 made in 1923, but not yet introduced, is well adapted to North Carolina, but in the eastern part it is several days later than the Missionary. It is larger, less acid, and somewhat darker than the Blakemore and is more promising in the strawberry regions of Maryland, Delaware, and New Jersey than in North Carolina. It may be of value for local markets in central and western North Carolina.

NAMING AND INTRODUCTION

The Blakemore variety was named for Marcus Blakemore, the first president of the National Preservers' Association. It is being introduced by cooperating nurseries in the Middle Atlantic States and by the Coastal Plain Branch Station of the North Carolina Department of Agriculture, Willard, N. C. The United States Department of Agriculture has no plants to sell or distribute.

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